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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/583,413	06/20/2006	Naohiro Yoshida	128229	3192

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OLIFF & BERRIDGE, PLC
P.O. BOX 320850
ALEXANDRIA, VA 22320-4850

EXAMINER	
CHUO, TONY SHENG HSIANG	
ART UNIT	PAPER NUMBER
1795	
MAIL DATE	DELIVERY MODE
08/10/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/583,413	YOSHIDA, NAOHIRO	
	Examiner	Art Unit	
	Tony Chuo	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *17-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *17-32* is/are rejected.

7)☒ Claim(s) *22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 June 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *6/20/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 6/20/06 was filed on 6/20/06. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Drawings

3. The drawings filed on 6/20/06 are accepted by the examiner.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

5. Claim 22 is objected to because of the following informalities: the phrase "is obtained" in line 6 should be deleted. Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 17, 20-29, and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "estimating" is indefinite because this term is inconsistent with the accepted meaning of determining the size or value of. It is unclear how an estimating device estimates whether there is a possibility that a chemical short is occurring in the fuel cell.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

9. Claims 17, 18, 20-22, 24-30, and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshida et al (WO 2004/049488).

Regarding claims 17, 18, 20, 26, 29, 30, and 32, the Yoshida reference discloses a fuel cell system comprising a fuel cell stack "10" which generates electricity by a chemical reaction between hydrogen (fuel gas) supplied to an anode side of the fuel cell stack and air (oxidization gas) supplied to a cathode side of the fuel cell stack; a control unit "100" that is able to regularly replenish (scavenge) the cathodes with air (scavenging gas) during the intermittent operation mode of the fuel cell system; a pressure sensor "51" for detecting a gas pressure of the fuel gas on the anode side of the fuel cell stack; valves "24" & "25"; and a compressor "41" (See pages 7, 8, 11 and Figure 1). It also discloses that migration of a portion of hydrogen through an electrolyte membrane from the anode side to the cathode side results in a chemical reaction (chemical short) on the cathode side so that oxygen present in the piping 35 is consumed and also the reduction in the amount of oxygen is offset by a supply of oxygen provided by appropriately operating the compressor "41", which is normally stopped during the intermittent operation mode (See page 11).

Examiner's note: The recitations "for supplying a scavenging gas to the cathode side when it has been estimated that there is a possibility that the chemical short is occurring" and "for scavenging residual gas on the cathode side by supplying a scavenging gas to the cathode side when a gas pressure decrease amount of the fuel

cell sealed on the anode side by the anode side being closed off by the closing means is larger than a reference value" are construed as process limitations that do not add additional structure to the fuel cell system. In addition, the control unit "100" is an equivalent structure for estimating whether there is a possibility that a chemical short is occurring in the fuel cell when supply of the fuel gas and the oxidization gas to the fuel cell is stopped; the pressure sensor "51" is an equivalent structure for detecting a gas pressure of the fuel gas on the anode side of the fuel cell; the valves "24" & "25" are equivalent structures for closing off the anode side of the fuel cell when supply of fuel gas and the oxidization gas to the fuel cell is stopped; the compressor "41" is an equivalent structure for supplying air (scavenging gas) to the cathode side when it has been estimated that there is a possibility that the chemical short is occurring and for scavenging residual gas on the cathode side by supplying a scavenging gas to the cathode side when a gas pressure decrease amount of the fuel gas sealed on the anode side by the anode side being closed off by the closing means is larger than a reference value. Further, it is well known in the art that a gas leak (hydrogen gas migration through the electrolyte membrane) can be detected (estimated) by sealing the anode side of the fuel cell with the valves and then monitoring a decrease in the gas pressure of the anode side of the fuel cell.

Regarding claim 21, it is inherent that the control unit "100" and the pressure sensor "51" are capable of being adapted to estimate that there is a possibility that a chemical short is occurring when it has been determined that a gas pressure decrease amount of the fuel gas sealed on the anode side by the anode side being closed off by

the closing device is greater than a first reference value. The teachings of a portion of the hydrogen that migrates through an electrolyte membrane from the anode side to the cathode side that results in a chemical reaction (chemical short) on the cathode side and in a closed system on the anode side, hydrogen gas pressure on the anode side inherently decreases as it migrates to the cathode side provide support for the control unit being capable of performing this function.

Regarding claim 22, it is inherent that the pressure sensor "51" is at least capable of detecting a first gas pressure of the fuel gas sealed on the anode side after a first predetermined period of time has passed after the anode side of the fuel cell is closed off, and detecting a second gas pressure of the fuel gas sealed on the anode side after a second predetermined period of time has passed after the first gas pressure is detected, and to obtain a difference between the first gas pressure and the second gas pressure as the gas pressure decrease amount.

Regarding claim 24, it is inherent that the gas pressure decrease amount of the fuel gas sealed on the anode side corresponds to the consumption amount of the oxidization gas on the cathode side by the obtained gas pressure decrease amount. Therefore, the control unit "100" and pressure sensor "51" are capable of estimating that there is a possibility that the chemical short is occurring when the estimated consumption amount is greater than a third reference value.

Regarding claim 25, it is inherent that the control unit "100" is capable of estimating again when it has been estimated that there is a possibility that the chemical short is occurring, whether there is a possibility that the chemical short is occurring.

Regarding claim 27, it is inherent that the compressor "41" (scavenging device) is capable of supplying to the cathode side an amount of the oxidation gas that is less than the amount of the oxidization gas supplied to the cathode side when the fuel cell is idling, when it has been estimated that there is a possibility that the chemical short is occurring.

Regarding claim 28, it also discloses fuel cell equipped electric vehicles that use a secondary battery capable of charging and discharging for driving the vehicle in addition to a fuel cell system (See page 1).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

10. Claims 17, 19, 20, 23, 25-27, 31, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by Boehm et al (US 6461751).

Regarding claims 17, 19, 20, 26, 31, and 32, the Boehm reference discloses a fuel cell system comprising a fuel cell stack "100" which generates electricity by a chemical reaction between hydrogen (fuel gas) supplied to an anode side of the fuel cell stack and air (oxidization gas) supplied to a cathode side of the fuel cell stack; a sensor "104" that detects the concentration of the oxygen in the cathode; a motor "112" & mechanical device "111" (scavenging device); a controller "105" that determines

whether oxidant starvation (chemical short) or a likelihood of oxidant starvation has been detected and then increases the oxidant stoichiometry by using the motor "112" & mechanical device "111" to supply additional oxidant to the cathode (See column 9, lines 8-21, column 10, lines 17-21, column 12, lines 50-56, column 15, lines 7-11; and Figure 1). It also discloses that when the sensor measures a hydrogen concentration that is above a threshold amount, then it is likely that oxidant starvation (chemical short) is occurring at the fuel cell cathode (See column 14 line 66 to column 15 line 2).

Regarding claim 23, it also discloses that a controller "105" that detects oxidant starvation (chemical short) by monitoring for the concentration of oxygen at the cathode to see when the concentration falls below a threshold value (reference value) (See column 14, lines 36-65).

Regarding claim 25, it is inherent that the controller "105" is capable of estimating again when it has been estimated that there is a possibility that the chemical short is occurring, whether there is a possibility that the chemical short is occurring.

Regarding claim 27, it is inherent that the motor "112" & mechanical device "111" are capable of supplying to the cathode side an amount of the oxidization gas that is less than the amount of the oxidization gas supplied to the cathode side when the fuel cell is idling, when it has been estimated that there is a possibility that the chemical short is occurring.

Examiner's note: The recitations "when the supply of the fuel gas and the oxidization gas to the fuel cell is stopped", "for supplying a scavenging gas to the cathode side when it has been estimated that there is a possibility that the chemical

short is occurring" and "for scavenging residual gas on the cathode side by supplying a scavenging gas to the cathode side when the gas concentration of the oxidization gas remaining in the cathode side of the fuel cell falls below a reference value when the fuel gas and the oxidization gas to the fuel cell is stopped" are construed as process limitations that do not add additional structure to the fuel cell system. In addition, the controller "105" is an equivalent structure for estimating whether there is a possibility that a chemical short is occurring in the fuel cell when supply of the fuel gas and the oxidization gas to the fuel cell is stopped; the sensor "104" is an equivalent structure for detecting a gas concentration of the oxidization gas on the cathode side; the motor "112" & mechanical device "111" is an equivalent structure for supplying air (scavenging gas) to the cathode side when it has been estimated that there is a possibility that the chemical short is occurring and for scavenging residual gas on the cathode side by supplying a scavenging gas to the cathode side when a gas concentration of the oxidization gas remaining on the cathode side falls below a reference value when the supply of the fuel gas and the oxidization gas to the fuel cell is stopped.

11. Claims 18 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Ueno et al (US 2001/0001287).

The Ueno reference discloses a fuel cell system comprising: a fuel cell stack "2" which generates electricity by a chemical reaction between hydrogen (fuel gas) supplied to an anode side of the fuel cell stack and air (oxidization gas) supplied to a cathode side of the fuel cell stack; a pressure sensor "25" for detecting a gas pressure of the fuel gas on the anode side of the fuel cell stack; valves "23" & "33" (closing device) that

closes off the anode side of the fuel cell when the supply of the fuel gas and the oxidization gas to the fuel cell is stopped; and an air supply system "40" (scavenging device) that is capable of scavenging residual gas on the cathode side by supplying air (scavenging gas) to the cathode side when a gas pressure decrease amount of the fuel gas sealed on the anode side by the anode side being closed off by the valves "23" & "33" is larger than a reference value (See paragraphs [0031],[0033],[0057] and Figure 1). It also discloses a comparison of the detected hydrogen gas pressure with a reference pressure to determine if there's a probability of a gas leakage due to a deterioration of the electrolyte membrane "5" (See paragraphs [0045],[0046]).

Examiner's note: The recitation "for scavenging residual gas on the cathode side by supplying a scavenging gas to the cathode side when a gas pressure decrease amount of the fuel cell sealed on the anode side by the anode side being closed off by the closing means is larger than a reference value" is construed as a process limitation that does not add additional structure to the fuel cell system. In addition, the pressure sensor "25" is an equivalent structure for detecting a gas pressure of the fuel gas on the anode side of the fuel cell; the valves "23" & "33" are equivalent structures for closing off the anode side of the fuel cell when supply of fuel gas and the oxidization gas to the fuel cell is stopped; and the air supply system "40" is an equivalent structure for supplying air (scavenging gas) to the cathode side when a gas pressure decrease amount of the fuel gas sealed on the anode side by the anode side being closed off by the closing means is larger than a reference value.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tony Chuo whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TC

/Jonathan Crepeau/
Primary Examiner, Art Unit 1795